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BIRDS COLLECTED DURING THE WHITNEY SOUTH SEA EXPEDITION. 53¹

NORTHERN SHORE BIRDS IN THE PACIFIC

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It is well known that many of the shore birds that breed in the arctic of eastern Asia or Alaska were first discovered in their winter range in the islands of the Pacific. The Pacific golden plover and the bristle-thighed curlew, for example, were obtained in the eighteenth century by the scientists that accompanied Captain James Cook on his voyages. Much scattered information has since been added to our knowledge of the ranges of the shore birds that winter in Oceania, but these data are entirely inadequate to give an accurate picture of the exact ranges of the species. The material obtained by the Whitney South Sea Expedition overcomes this deficiency to a large extent and has enabled me to prepare a much more adequate account. Extensive use was also made of the literature and of the material of the Rothschild Collection. In using these data it must not be forgotten that they are based entirely on fortuitous collecting. They are sufficient for a determination of the rough outlines of the winter quarters and the approximate migratory season. They are, however, insufficient for the exact determination of the normal winter quarters and the normal migratory seasons (see also Stresemann, 1941, Jour. Ornith., vol. 89, pp. 69-75). Such can be obtained only by around-the-year recordings of resident observers. A good start in this field has already been made in the south temperate zone (for example, Serventy's paper on the wintering waders of

the Swan River Estuary, Western Australia, 1938, Emu, vol. 38, pp. 18-29), but the tropics have so far been woefully neglected.

The present paper may serve as a starting point for such future studies. It covers Polynesia, northern Melanesia, and the eastern Papuan Islands. The adjoining regions are referred to in the discussion, but the available specimens are not listed separately. For the nomenclature of the islands I have used as far as possible Brigham's "An index to the islands of the Pacific Ocean" (1900).

The species that were selected for this study are the seven kinds that are most frequently encountered in Polynesia. They are:

- Pacific Golden Plover (*Pluvialis dominica fulva*)
- Bristle-thighed Curlew (*Numenius tahitiensis*)
- Pacific Godwit (*Limosa lapponica baueri*)
- Gray-rumped Tattler (*Heteroscelus incanus brevipes*)
- Wandering Tattler (*Heteroscelus incanus incanus*)
- Turnstone (*Arenaria interpres*)
- Sanderling (*Crocethia alba*)

Winter range and migration of each of these species are discussed. This is followed by a list of the specimens in the Rothschild, Whitney, and other collections of the American Museum of Natural History, as far as they come from the stated area.

I wish to thank Dr. Robert Cushman Murphy and Dr. Ernst Mayr for their advice and assistance, without which this study could not have been completed.

¹ The preceding ten papers in this series are American Museum Novitates, nos. 1091, 1116, 1133, 1144, 1152, 1166, 1175, 1176, 1192, and 1237. For a list of the earlier papers, see no. 1176.

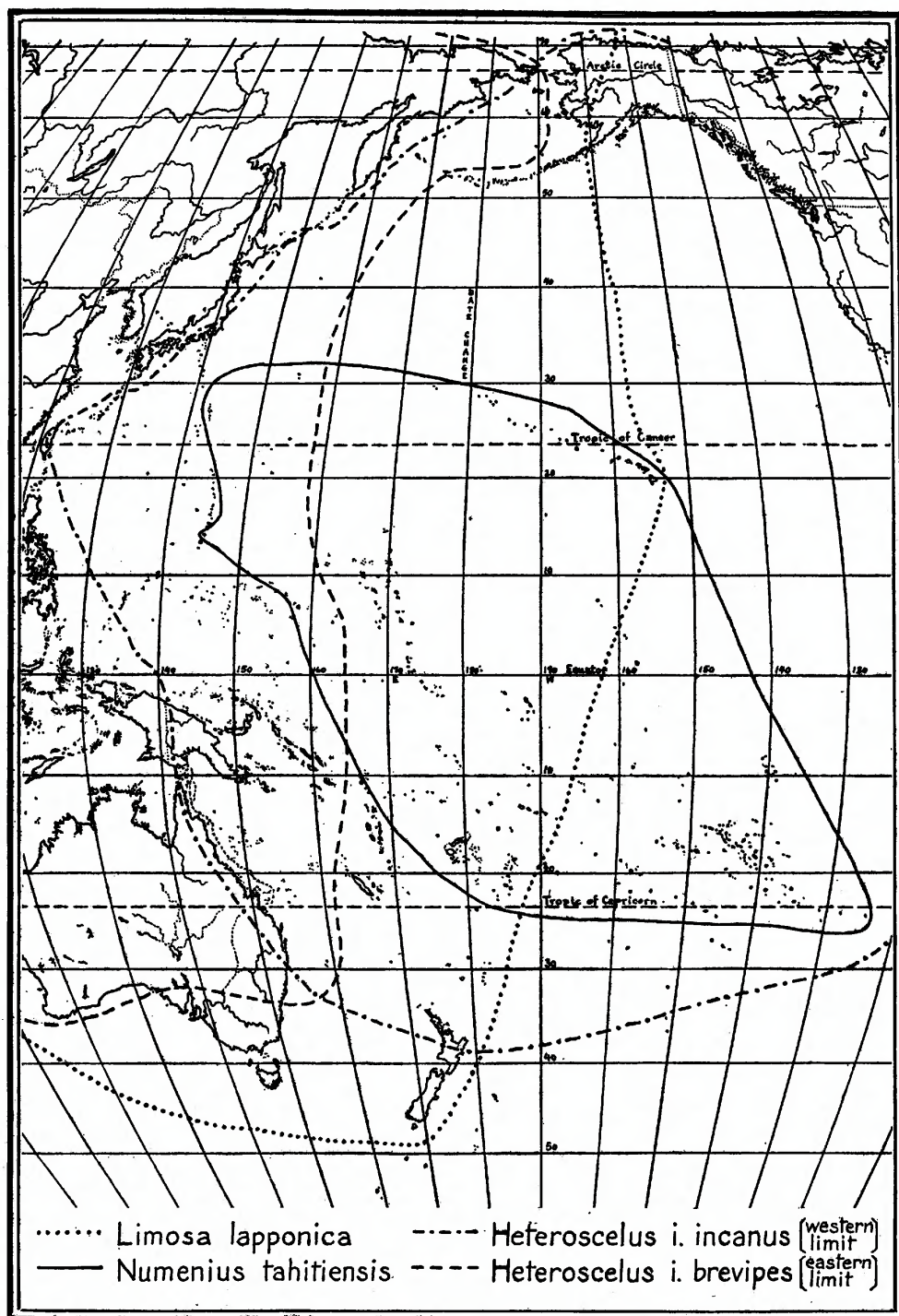


Fig. 1. The winter range of the bristle-thighed curlew, the eastern limit of the ranges of the bar-tailed godwit and the Asiatic wandering tattler, and the western limit of the range of the American wandering tattler.

Pluvialis dominica fulva (Gmelin)

PACIFIC GOLDEN PLOVER

The golden plovers have a circumpolar breeding range in the arctic of the Old and the New Worlds, but their winter range is even more extensive. The subspecies *fulva* has been found on migration and in winter throughout the Indian and Pacific oceans, with stragglers reaching Africa in the west and the American coast in the east. The main wintering area, however, is the Malay Archipelago and the islands of Oceania.

The birds travel in Oceania apparently to the easternmost and southernmost limits of Polynesia, as indicated by records from Southern Marutea (Tuamotu Is.) and Rurutu (Austral Is.), and by the fact that the literature reports them as frequent winter visitors to New Zealand, Tasmania, and South Australia. The Whitney collections do not permit the determination of the northern border of the winter range, but a study of the literature indicates that it runs from central China to the Californian coast, including the Hawaiian Islands. The rather even scattering of the records through Polynesia makes it appear unlikely that the birds follow definite migration routes. They probably advance southward along a broad front, although the closely related American golden plover (*Pluvialis d. dominica*) has a well-defined and rather circumscribed migration route. It is entirely unknown what prevents the birds from overshooting their goal in the Tuamotus, Austral, and Tonga Islands, which would mean inevitable death in the unbroken wastes of the South Pacific Ocean. Golden plovers generally travel in smaller or larger flocks, and it is not impossible that tradition, that is, guiding by older birds, plays some rôle.

The return migration starts in March in the southern outposts (New Zealand, southern Australia), and by the end of May the majority of birds have left Oceania. A few remain, however, in the tropical and subtropical parts of their winter range, and some individuals may be found in every month of the summer (see list). Most of these birds are either in winter plumage or in a very incomplete

breeding dress. Our knowledge of the plumages of this species is too insufficient to tell us whether such individuals are first-year birds or whether they have failed to migrate on account of a physiological disturbance. In the four summer months, the following number of specimens were collected in the area between the Bismarck Archipelago and eastern Polynesia:

8 (May), 17 (June), 9 (July), and 9 (August)

This accounts for 33 per cent of the entire collection.

MICRONESIA

MARIANA ISLANDS: Saipan, 1 ♀, Sept. 8 (Owston); Assuncion, 2 unsexed, Feb. 16 (Owston); Guam, 1 ♂, Mar. 8 (Owston), 1 ♂, Aug. 15 (Whitney), 1 ♀, Mar. 8, 2 unsexed, Mar. 7, 27 (Owston).

PALAU: 5 ♂, 2 ♀, Oct. 13, Nov. 13, 15.¹

CAROLINE ISLANDS: Ponape, 1 ♂, 1 ♀, Dec. 15; Kusaie, 4 ♂, Mar. 10-30, 5 ♀, Mar. 10-30; Ruk, 1 ♂, 2 ♀, Feb. 6 (Owston).

GILBERT ISLANDS: Tarawa, 1 ♂, Jan. 3 (Townsend).

EASTERN PAPUAN ISLANDS

Samarai, 1 ♀, Sept. 18; Doini, 1 ♂, Nov. 7, 1 ♀, Dec. 3 (Zimmer); Fergusson, 1 ♀, Jan.; Woodlark, 4 ♂, Oct. 20, 23, 24; Misima (= St. Aignan), 4 ♀, Sept. 10, Dec. 18, 21 (Meek); Tagula (= Sudest), 1 ♂, Jan. 25, 1 ♀, Feb. 25 (Meek), 1 ♂, Feb. 15 (Whitney); Rossel, 1 ♂, Jan. 26, 3 ♀, Jan. 27, Feb. 11, 16 (Meek).

NORTHERN MELANESIA

BISMARCK ARCHIPELAGO: Hermit Group, 1 ♀, May 24; Manus, 1 ♂, 1 ♀, Oct. 12 (Meek); St. Matthias, 1 ♀, July 14 (Eichhorn); New Hanover, 1 ♀, Mar. 13 (Eichhorn); New Ireland, 2 ♀, Mar. 5 (Eichhorn); Nissan, 2 ♂, Aug. 1, 20, 4 ♀, Aug. 5, 23, Sept. 8, 14 (Eichhorn); Feni, 4 ♂, June 5, 7, 3 ♀, June 6, 7, July 5 (Eichhorn); Lihir Is., 1 ♂, 1 ♀, Oct. 25, 26; Boang (Tanga Group), 1 ♂, Feb. 4; Duke of York Is., 1 ♀, Oct. 13 (Kleinschmidt); New Britain, 1 ♂, Oct. 4, 2 ♀, Mar. 4, 28.

SOLOMON ISLANDS: Munia, 1 ♂, 1 ♀, Sept. 18, 19 (Ribbe); Shortland Is., 1 ♂, 1 ♀, Sept. 11; Choiseul, 2 ♂, Oct. 3, 12; Vella Lavella, 1 ♀, Mar. 9 (Meek); Narovo, 2 ♂, Oct. 26, 27; Vangunu, 1 ♂, July 21; Tetipari, 1 ♂, 1 ♀, Aug. 6, 7; Gizo, 1 ♀, Nov. 3; Ontong Java, 1 ♂, Oct. 6; Gower, 2 ♀, Mar. 5, Apr. 3; Malaita, 1 ♀, Feb. 26; Bauro, 2 ♂, Mar. 31, 2 ♀, Apr. 1, 2.

¹ Material listed without specific mention of the collector was obtained by the Whitney South Sea Expedition.

SOUTHERN MELANESIA

SANTA CRUZ: Nupani, 1 unsexed, Oct. 15;
Vanikoro, 2 ♂, Sept. 25, Oct. 28.

NEW HEBRIDES: Leleppa, 1 ♀, Dec. 22; Tanna,
4 ♂, July 18, Nov. 11.

LOYALTY ISLANDS: Lifu, 1 ♂, Aug. 29.

CENTRAL POLYNESIA

FIJI ISLANDS: Lakemba, 1 ♂, Sept. 2; Wailan-
gilala, 1 ♂, Sept. 29; Viti Levu, 1 ♀, Oct.
(Kleinschmidt); Moala, 1 ♂, July 12; Thithia,
2 ♂, Sept. 15; Nanuku Levu, 1 ♀, Nov. 26.

TONGA ISLANDS: Pudukudua, 2 ♂, 1 ♀, July
31; Tokulu, 1 ♂, Aug. 1.

SAMOA ISLANDS: Tutuila, 3 ♂, Nov. 1, 20,
Feb. 19, 3 ♀, Nov. 13, 27; Olosenga, 2 ♂,
2 ♀, Dec. 31; Rose, 1 ♂, Dec. 12.

Small Islands of Central Polynesia: Wallis, 1 ♂,
Apr. 27; Keppel, 1 ♀, Aug. 26; Nassau, 1 ♂,
3 ♀, Feb. 27; Suvárov, 6 ♂, Sept. 10, 12,
18, 20, 6 ♀, Aug. 30, Sept. 3, 17, 18, 20.

UNION GROUP: Fakaafo, 9 ♂, Apr. 2, 5, 3 ♀,
Apr. 1, 3.

PHOENIX GROUP: Canton, 4 ♂, Mar. 14;
Enderbury, 1 ♂, 1 ♀, Mar. 19; Hull, 3 ♂,
Mar. 26, 28; Sydney, 2 ♂, Mar. 21.

EASTERN POLYNESIA

SOCIETY ISLANDS: Scilly, 1 ♂, Jan. 3; Mopelia,
1 ♂, Dec. 20; Bora-Bora, 1 unsexed, Jan.
13; Raiatea, 1 ♂, Jan. 9; Moorea, 1 ♂,
Nov. 3, 1 ♀, June 30; Tahiti, 2 ♂, Nov. 3,
30, 2 ♀, Oct. 11, Nov. 27, 2 unsexed, May 31.

AUSTRAL ISLANDS: Rurutu, 2 ♀, Mar. 21.

TUAMOTU ARCHIPELAGO: Tikahau, 3 ♂, June
20, 21, 1 ♀, June 21; Kaukura, 1 ♂, 2 ♀,
June 15; Toau, 1 ♂, Apr. 17; Apataki, 2 ♂,
3 ♀, June 7, 11, 12; Tikei, 1 ♀, Dec. 13;
Taiao, 1 ♀, May 29; Raraka, 2 ♂, Mar. 13,
17, 2 ♀, Mar. 12, 16; Tepoto, 1 ♀, May 1;
Katiu, 1 ♀, May 25; Hiti, 1 ♀, Oct. 20;
Tuanake, 1 ♀, May 6; Raroia, 1 ♂, May 14;
Hao, 1 ♀, Nov. 2 (Chapin); Vanavana, 1 ♀,
June; Tenarunga, 1 ♂, 1 ♀, June 14;
Napuka, 1 ♂, Dec. 11; Takapoto, 1 ♀, 1
unsexed, Feb. 24; Matahiva, 1 ♂, 1 ♀, June
27; Ahii, 2 ♂, Aug. 26, Feb. 6; Fakarava,
1 ♂, Apr. 18; Tahanea, 1 ♂, Mar. 21, 2 ♀,
Mar. 21, 24; Makemo, 2 ♂, 1 ♀, May 21,
22, 23; Marutea, 1 ♂, May 17.

MARQUESAS ISLANDS: Eiau, 1 ♂, Sept. 30;
Nukuhiva, 1 ♂, Sept. 16.

LINE ISLANDS: Christmas, 1 ♂, Feb. 14.

Numenius tahitiensis (Gmelin)

BRISTLE-THIGHED CURLEW

Breeding and winter range of this species
are restricted and well circumscribed, just
the opposite to what we find in the case of
the golden plover. The breeding range,
which is not yet exactly known, is some-
where in western Alaska, the winter range
in eastern and central Polynesia.

Henderson and Oeno Islands (southeast
of the Tuamotus) mark about the eastern
limit of the range. The Tuamotus, Cook
Islands, Tongas and Fijis mark the south-
ern limits. There are no records from the
Austral Islands, although there is little
doubt that the species will be found there
sooner or later. The literature reports the
species repeatedly from the Cook Islands
(Hervey, Palmerston), but I have not ex-
amined any skins from these islands. The
Whitney expedition has definitely extended
the known western range of the species by
recording it for the first time in the Santa
Cruz Islands (Tucopia) and in the Carol-
ines (Ponape). A female from the Bonin
Islands (obtained September 21, 1910, by
Owston's collectors on Chichijima Island)
constitutes the extreme western record.
The northern limits of the winter range
cannot be determined very accurately, but
the species occurs apparently regularly in
the Hawaiian chain from September to
spring and is also found regularly in the
Marshall Islands, Line Islands, and the
Marquesas. A single Tonga bird, collected
on July 31, may indicate the beginning of
the autumn migration. This accelerates
during August, and after August 22 the
species seems to be regular in its winter
range until May. The presence of no less
than 24 June specimens from Polynesia in
the Whitney collections indicates that a
considerable number of birds summer in
the winter quarters. It is impossible to de-
cide whether they are first-year birds or
sick individuals.

MICRONESIA

CAROLINE ISLANDS: Ponape, 1 ♂, 1 ♀, Dec.
15.

SOUTHERN MELANESIA

SANTA CRUZ: Tucopia, 3 ♀, Feb. 11, 12.

CENTRAL POLYNESIA

FIJI ISLANDS: Ngele Levu, 1 ♂, Nov. 28.

TONGA ISLANDS: Pudukudua, 1 ♂, July 31;
Toku, 2 ♂, 1 ♀, Aug. 14.

SAMOA ISLANDS: Rose, 1 ♂, 2 ♀, Dec. 11.

Small Islands of Central Polynesia: Niue, 1
unsexed, Sept. 18 (Travers); Suvárov, 13
♂, Aug. 29, 30, 31, Sept. 4, 7, 10, 12, 14, 15,
16 ♀, Aug. 29, 30, Sept. 5, 7, 10, 18, 20, 21.

PHOENIX GROUP: Howland, 1 unsexed, Sept.
27 (Munro); Phoenix, 4 ♂, Mar. 10; Canton,
2 ♂, 2 ♀, Mar. 11, 12, 17.

EASTERN POLYNESIA

SOCIETY ISLANDS: Scilly, 2 ♀, Dec. 23, 26; Mopelia, 1 ♂, 1 ♀, Dec. 18; Tetiaroa, 1 unsexed, Nov. 19.

TUAMOTU ARCHIPELAGO: Matahiva, 2 ♂, June 27; Tikahau, 1 ♂, 2 ♀, June 21, 22; Rangiroa, 2 ♂, 2 ♀, Aug. 22, 24; Apataki, 1 ♀, June; Toau, 2 ♂, Apr. 16, 17, 2 ♀, Apr. 17, June 6; Tahanea, 1 ♂, Mar. 20; Tuanake, 1 ♀, May 3; Kauehi, 3 ♀, Mar. 5, 9; Hiti, 2 ♂, May 9, Oct. 20, 2 ♀, May 4; Makemo, 1 ♂, May 22; Raroia, 1 ♀, May 15; Paraoa, 1 unsexed, June 28; Ahunui, 1 ♂, June 26; Vanavana, 1 ♂, June 23; Tureia, 1 ♀, June 20; Tenararo, 6 ♂, June 9, 15, 16; Tenarunga, 1 ♂, June 13; Maturei-Vavao, 3 ♂, June 5, 6; S. Marutea, 2 ♂, 2 ♀, May 15, 16; Maria, 1 ♂, 1 unsexed, June 2.

MARQUESAS ISLANDS: Hatutu, 1 ♀, Oct. 14; Eiau, 1 ♂, Sept. 20; Nukuhiva, 3 ♂, 1 ♀, Oct. 5; Fatuhuku, 1 ♀, Nov. 8.

SOUTH PACIFIC: Oeno, 2 ♂, Apr. 14; Henderson, 2 ♂, 2 ♀, Mar. 16, 17, 1 unsexed, Apr. 10.

LINE ISLANDS: Palmyra, 1 ♂, 1 unsexed, Aug. 21 (Waters); Washington, 1 ♂, Aug. 13 (Waters); Christmas, 3 ♂, Feb. 14.

Limosa lapponica baueri Naumann

PACIFIC GODWIT

This subspecies has recently been subdivided by Portenko (1936, Auk, vol. 53, pp. 194-197), but this author neglects to mention possible differences in the winter plumage and also leaves the question of the nomenclature entirely undecided (see Mayr, 1936, Auk, vol. 53, p. 367). For these reasons it seems best to treat the name *baueri* collectively and to use it for all the specimens which Portenko refers to two different subspecies.

The race *baueri*, as just defined, has a wide breeding range from the Lena River in Siberia eastward to Bering Strait and in Alaska eastward to the Colville Delta. The winter range extends in the west beyond the region covered by the Whitney expedition. The principal wintering area seems to be Australia (and New Zealand). Stragglers occur as far west as the Greater Sunda Islands, the Malay Peninsula, the coast of China, and the Philippines. In the east occasional stragglers are found as far as Laysan and the Hawaiian Islands. The normal eastern limit seems to run through Samoa, Tonga, Kermadecs, and the New Zealand group. Neither the literature nor the Whitney collections contain a single

record from eastern Polynesia, east of Samoa. Even in western Polynesia the species is, on the whole, rather scarce.

A few non-breeding individuals are found in Australia and New Zealand during every month of the year. This makes it very difficult to determine the exact time of migration. The earliest migrants probably arrive in Polynesia in late August and the latest ones leave in May, but there is a remarkable series of nine birds from Fiji, collected on June 22, 23. Most of these non-breeding individuals are probably not yet fully adult.

MICRONESIA

MARIANA ISLANDS: Guam, 2 ♀, Sept. 26 (Owston).

PALAU: 1 ♂, 1 ♀, Nov. 21, 23.

EASTERN PAPUAN ISLANDS

Rossel: 1 ♂, Mar. 12 (Meek).

NORTHERN MELANESIA

SOLOMON ISLANDS: Ontong Java, 2 ♂, Oct. 2.

SOUTHERN MELANESIA

SANTA CRUZ: Tucopia, 1 ♀, Feb. 11; Reef, 1 ♂, 1 unsexed, Oct. 7.

NEW HEBRIDES: Aniwa, 1 ♂, 1 ♀, Dec. 24 (Macmillan).

LOYALTY ISLANDS: Uvea, 1 ♂, May 4 (Macmillan).

CENTRAL POLYNESIA

FIJI ISLANDS: Ono ilau, 5 ♂, 4 ♀, June 22, 23.

SAMOA ISLANDS: Tutuila, 1 ♂, Nov. 30.

Heteroscelus incanus brevipes (Vieillot)

GRAY-RUMPED TATTLER

The Asiatic wandering tattler winters in the Western Pacific and more specifically in the area enclosed by Celebes, Australia, and New Guinea. Stragglers reach in the west the coast of southern China, the Malay Peninsula, and Sumatra; in the east they spread out as far as eastern Micronesia (Ruk, Kusaie), the Solomon Islands, the Louisiades, and Norfolk Island. The majority winters south of the equator, but some individuals stay as far north as the Philippines and the islands of Micronesia.

The Whitney South Sea Expedition worked only along the eastern fringe of the winter range of this subspecies, and it would

be futile to base any generalizations on the scanty information obtained; the raw data are listed below. The one fact that stands out is the small number of individuals summing in Oceania. Among the 51 birds of the collection, there is not a single example taken between June 2 and August 20. The migration route of this subspecies leads apparently from its breeding quarters in eastern Siberia to Japan and through the Philippines and the Marianas to Australia. The absence of this subspecies from central Polynesia indicates that it does not cross the North Pacific on a wide front.

MICRONESIA

MARIANA ISLANDS: Saipan, 1 ♀, Sept. 8 (Owston); Guam, 1 ♂, Sept. 14, 3 ♀, Mar. 4, 13, Dec. 5, 1 unsexed, Feb. 11 (Owston).

PALAU: 2 ♂, 2 ♀, Nov. 8.

CAROLINE ISLANDS: Ruk, 3 ♀, Feb. 6, 26, Oct. 14 (Owston); Kusaie, 2 ♀, Mar. 10-20, Apr.

EASTERN PAPUAN ISLANDS

Doini, 1 ♂, 1 ♀, Nov. 9, Dec. 3 (Zimmer); St. Aignan, 1 ♂, Nov. 29 (Meek); Sudest, 1 ♂, 1 ♀, Feb. 25, Apr. 22 (Meek); Rossel, 2 ♀, Feb. 12 (Meek).

NORTHERN MELANESIA

BISMARCK ARCHIPELAGO: New Ireland, 4 ♂, Feb. 29, Mar. 1, 3, June 2, 5 ♀, Feb. 29, May 31, Aug. 20 (Eichhorn); Duke of York Is., 1 unsexed (Kleinschmidt); New Britain, 1 ♂, Mar. 5 (Eichhorn); Lihir Group, 1 ♂, Nov. 15.

SOLOMON ISLANDS: Bougainville, 1 ♀, Feb. 20; Shortland Group, 2 ♂, 2 ♀, Sept. 11; Choiseul, 3 ♂, Oct. 5, Nov. 29; Ysabel, 1 ♀, Sept. 10; Vella Lavella, 1 ♂, 2 ♀, Mar. 6, 7, 16 (Meek); Kulambangra, 1 ♀, Oct. 11; Beagle, 1 ♂, Apr. 22; Ontong Java, 1 ♂, 1 ♀ (?), Oct. 6; Awa Raha, 1 ♂, 1 ♀, Mar. 15.

Heteroscelus incanus incanus (Gmelin)

AMERICAN WANDERING TATTLER

The principal winter quarters of the American wandering tattler are the islands of eastern Oceania. It nests from south-central Alaska and east-central Yukon south to Prince William Sound. On migration it occurs on the northeast coast of Asia, on the islands of the Bering Sea, and along the coast of North and South America. Along this coast it migrates as far as the Chincha Islands, Peru, and the Galápagos

Islands, but by far the greatest number of birds seems to winter in eastern Polynesia. In the south, individuals of this species are found in the Austral and Tonga Islands, but there is only a single record from the Kermadec Islands, the record of a single pair of birds from New Zealand, and of four specimens from Norfolk Island. The species is more common on New Caledonia, and there are a number of records from the New Hebrides and the other islands of southern Melanesia.

Bering Strait clearly separates the breeding ranges of the American and of the Asiatic races of the wandering tattler. The winter ranges, however, overlap broadly. The zone of overlap includes the following geographical districts: the Australian east coast, Solomon Islands, Bismarck Archipelago, the eastern half of the New Guinea region, Caroline Islands, and Marianas. A line drawn from Cape York through Manam (Vulcan Island) and Palau to the Marianas indicates roughly the western limit of stragglers of this subspecies. Old records for the Aru Islands, Waigeu, and western New Guinea should be checked. There is reason to believe that they refer to misidentified specimens of *brevipes*.

In view of the difficulty in distinguishing between the two subspecies, it might be worth while to list the diagnostic characters of *incanus*. It differs from *brevipes* as follows:

Nasal groove extends considerably beyond half the length of the exposed culmen, ending within less than 15 mm. from the tip of the bill. Plates on the back of the tarsus more or less divided into small scutes, at least at the lower part of the tarsus.

NUPTIAL DRESS: The barring of the under parts heavier and more extensive; only a small area in the middle of the abdomen remains unbarred. Under tail-coverts always distinctly barred.

WINTER DRESS: Upper parts darker and purer gray. Upper tail-coverts either uniform gray or with very inconspicuous narrow light edging, not as in *brevipes* with two or more distinct regular white bars or broad white tips.

SIZE: Larger, wing up to 178 or 182 mm.,

rarely below 170; in *brevipes* the wing is generally 160-170, rarely up to 173.

The fact that *incanus* is found commonly on Hawaii and on all the islands of eastern Polynesia shows clearly that it migrates along a broad front. On the other hand, the comparative frequency of the species on the Marianas indicates that some of the birds may follow the coast line of Kamchatka, the Kuriles, and the Japanese Islands. Undoubtedly there is also a certain migration along the American coast.

The principal winter range of the species is best illustrated by listing the number of specimens in the Whitney and Rothschild collections from the various parts of Oceania: eastern Polynesia, 114; central Polynesia, 35; Micronesia, 26; southern Melanesia, 10; northern Melanesia, 4. The scarcity of records from New Zealand and from Australia indicates the essentially tropical location of the winter range of this subspecies. Among the listed 189 specimens, only 17 were obtained between June 10 and August 15, namely, 11 between June 10 and June 30, 3 in July and 3 between August 1 and 14. Non-breeding birds have been found in every month of the year both on the Galápagos Islands and on Hawaii.

MICRONESIA

MARIANA ISLANDS: Guam, 1 ♂, Aug. 15 (Whitney), 1 ♂, Apr. 23 (Owston), 1 ♀, Aug. 15 (Whitney), 1 unsexed, Apr. 23 (Owston).

PALAU: 1 unsexed (Kubary).

CAROLINE ISLANDS: Ponape, 1 ♂, Dec. 15; Ruk, 1 ♀, June 15 (Owston); Kusaie, 13 ♂, 6 ♀, Feb., Mar. 10-20, 20-30, Apr. 1-10.

NORTHERN MELANESIA

VULCAN ISLAND: 1 ♂, Dec. 24 (Meek).

BISMARCK ARCHIPELAGO: New Ireland, 1 ♂, July 2 (Eichhorn); Lihir Group, 1 ♂, Nov. 16.

SOLOMON ISLANDS: Ysabel, 1 ♀, Sept. 10.

SOUTHERN MELANESIA

SANTA CRUZ: Vanikoro, 1 ♂, Sept. 25; Utupua, 3 ♂, Sept. 29.

BANKS ISLAND: Valua, 1 ♀, Sept. 18.

NEW HEBRIDES: Tanna, 1 ♂, 2 ♀, Apr. 13, Nov. 12, 15 (Macmillan); Aniwa, 1 ♀, Dec. 20 (Macmillan); Erromanga, 1 ♂, Mar. 15 (Macmillan).

CENTRAL POLYNESIA

FIJI ISLANDS: Lakemba, 1 ♀, Sept. 2; Kandavu, 1 ♂, Nov. 6; Wakaya, 1 ♂, Oct. 18; Alewa Kalou, 1 ♀, Jan. 6.

TONGA ISLANDS: Oua, 1 ♀, Aug. 3; Fonoifua, 1 ♂, July 20.

SAMOA ISLANDS: Tutuila, 4 ♂, Feb. 19, Nov. 1, 9, 24, 2 ♀, Oct. 30, Nov. 9; Olosenga, Manua, 1 ♂, Dec. 31; Rose, 1 ♀, Dec. 12.

Small Islands of Central Polynesia: Niaufofua, 1 ♂, Aug. 17; Keppel, 1 ♀, Aug. 25; Danger, 1 ♀, Feb. 27; Suvárov, 6 ♂, Sept. 6, 15, 17, 18, 5 ♀, Aug. 30, Sept. 3, 15, 18, 19.

UNION GROUP: Fakafo, 4 ♀, Apr. 3, 6.

PHOENIX GROUP: Hull, 1 ♂, Mar. 27; Sydney, 2 ♂, Mar. 21, 31.

EASTERN POLYNESIA

SOCIETY ISLANDS: Bora-Bora, 1 ♀, Jan. 13; Raiatea, 1 ♀, Jan. 9; Moorea, 2 ♂, June 14, 23, 3 ♀, June 23, July 16, Aug. 5; Tahiti, 5 ♂, Aug. 31, Oct. 6, 8, 11, Nov. 3, 9 ♀, Aug. 31, Oct. 9, 11, Nov. 3, 25, 31, 3 unsexed, Aug. (Wilson); Huahine, 2 unsexed, Nov. 16 (Mus. Godeffroy, Mus. Young).

AUSTRAL ISLANDS: Rurutu, 1 ♂, 1 ♀, Mar. 21; Rimatara, 1 ♀, Mar. 28; Tubuai, 2 ♀, Apr. 5, 2 ♀, Mar. 3 (Seale); Vavatao, 2 ♂, Apr. 25; Rapa, 1 ♂, Feb. 20.

TUAMOTU ARCHIPELAGO: Matahiva, 2 ♂, June 23, 27; Rangiroa, 2 ♂, 4 ♀, June 18, Aug. 23; 24; Makatea, 2 ♀, Aug. 18; Ahii, 1 ♂, Aug. 26; Manihi, 1 ♂, Feb. 8; Apataki, 1 ♂, June 8; Toau, 2 ♂, 1 ♀, Apr. 17, June 6; Aratika, 1 ♂, June 1; Fakarava, 6 ♀, Apr. 18, 23, 24; Faaite, 1 ♂, Apr. 28; Takaroa, 2 ♂, 2 ♀, Feb. 28, Aug. 28, Sept. 18; Takapoto, 2 ♂, 1 ♀, Feb. 23, Aug. 29; Tikei, 1 ♂, Aug. 31; Kauehi, 1 ♀, Mar. 19; Tahanea, 2 ♂, Mar. 21, 25; Anaa, 1 ♀, Oct. 21; Tuanake, 2 ♂, 1 ♀, May 3, 5; Makemo, 1 ♂, 1 ♀, May 22, 23; Taenga, 1 ♂, May 17; Nihiru, 1 ♂, Oct. 18; Raroia, 3 ♂, May 12, 14, 15; S. Marutea, 2 ♂, May 24, 27; Fakahina, 1 ♂, Oct. 15; Napuka, 2 ♂, Dec. 11; Hao, 3 ♂, Oct. 17 (Whitney), Oct. 28, Nov. 1 (Chapin); Ahunui, 1 ♂, June 26; Tureia, 1 ♂, June 19; Tenararo, 1 ♂, June 9; Tenarunga, 1 ♂, June 13; Maturai-Vavao, 1 ♂, 1 ♀, June 5; Maria, 1 ♂, 1 ♀, May 30, June 8; Aukena, 1 ♀, Apr. 27; Moota Teiko, 1 ♂, May 4; Kamaka, 1 ♀, May 5; Mangareva, 1 ♂, May 8; Timoe, 1 ♂, Apr. 24; Henderson, 1 ♀, Mar. 17; Ducie, 1 ♂, Mar. 29.

MARQUESAS ISLANDS: Eiau, 1 ♂, 1 ♀, Sept. 20, Oct. 2; Motuiti, 1 ♀, Sept. 19; Nukuhiva, 1 ♂, 1 ♀, Sept. 18, Oct. 23; Upau, 2 ♂, Sept. 8; Hivaaoa, 2 ♂, Jan. 26, 27.

LINE ISLANDS: Christmas, 1 ♀, Feb. 18.

Arenaria interpres interpres (Linnaeus)

TURNSTONE

The breeding range of the turnstone is circumpolar, and its wintering range is cir-

cumtropical. In this respect its distribution much resembles that of the golden plover, and as in that species no eastern or western border of the winter range exists. However, the Whitney South Sea Expedition encountered turnstones in Polynesia in much smaller numbers than golden plovers. Accurate comparative census work is needed to determine whether this is due to a greater rarity of the turnstone throughout its range, or to a tendency of the turnstone to hug the continental coasts more closely, avoiding extensive overseas migrations. The fact that the species is entirely unrecorded from eastern Polynesia (Marquesas, Tuamotus, Austral Islands, Society Islands, Cook Islands) indicates that the second explanation is more probable. Still, the species is common on the Galápagos Islands and not infrequent in Hawaii, on the Phoenix Islands, Samoa, and other truly Pacific Island groups. In the south they wander almost as far as land extends, that is, to southern New Zealand and to south Australia. The northern limits of the normal winter range are in the Hawaiian Islands and the islands of Micronesia.

The migration season begins in August and ends in May. Six of the 72 dated specimens, listed below, were taken in the months of June, July, and August, indicating that they were summering in their winter range. The occurrence of stragglers of this species in all the months of the year has been recorded from nearly all tropical and subtropical localities, as, for example, the Galápagos and Hawaiian Islands. Some of these birds may assume a partial nuptial plumage.

MICRONESIA

MARIANA ISLANDS: Guam, 1 ♂, 2 ♀, Mar. 22, 27 (Owston), 1 ♀, Aug. 18 (Whitney).

PALAU: 1 ♂, 2 ♀, Dec. 8.

CAROLINE ISLANDS: Ponape, 1 ♂, Dec. 16 (Whitney), 2 ♂, 1 ♀ (Kubary); Ruk, 1 ♂ (?), 1 ♀, Feb. 7, Mar. 1, 2 unsexed, Feb. 5, July 14 (Owston); Kusaie, 4 ♂, 3 ♀, Mar. 10-20, 20-30.

EASTERN PAPUAN ISLANDS

WOODLARK ISLAND: 1 ♂, Oct. 23.

NORTHERN MELANESIA

BISMARCK ARCHIPELAGO: Storm, 1 ♀, Sept. 6 (Eichhorn).

SOLOMON ISLANDS: Poharan (Bougainville), 1 ♂, Apr. 1; Ontong Java, 3 ♂, 1 ♀, Oct. 6; Gizo, 1 ♀, Nov. 3; Ramos, 1 ♂, Sept. 4; Bairo, 1 ♀, Apr. 2; Awa Raha, 2 ♂, 1 ♀, Mar. 15.

SOUTHERN MELANESIA

SANTA CRUZ: Vanikoro, 2 ♂, Sept. 25; Utupua, 1 ♀, Sept. 30; Reef, 3 ♀, Oct. 7; Duff, 3 ♀, Oct. 4.

NEW HEBRIDES: Aniwa, 1 ♀, Dec. 20 (Macmillan).

LOYALTY ISLANDS: Beupre, 1 ♀, June 12 (Macmillan).

CENTRAL POLYNESIA

FIJI ISLANDS: Wailangila, 1 ♀, Sept. 29; Ono ilau, 2 ♀, June 24; Yasawa, 1 ♀, Jan. 8; Ngele Levu, 1 ♂, Nov. 28.

TONGA ISLANDS: Tokulu, 1 ♀, Aug. 1.

SAMOA ISLANDS: Olosenga, Manua, 1 ♀, 1 unsexed, Dec. 31; Rose, 1 ♀, Dec. 11.

UNION GROUP: Fakaafu, 2 ♂, 4 ♀, Apr. 3, 4.

PHOENIX GROUP: Hull, 2 ♀, Mar. 27, 31; Sydney, 2 ♂, 1 ♀, Mar. 21; Enderbury, 2 ♂, Mar. 19; Canton, 2 ♂, 3 ♀, Mar. 11, 12, 14; Howland, 1 ♀, Sept. 26 (Munro).

EASTERN POLYNESIA

LINE ISLANDS: Christmas, 1 unsexed, Feb. 14.

Crocethia alba (Pallas)

SANDERLING

The sanderling is another circumpolar Holarctic species which on its migration scatters over most of the globe, extending in the temperate zone of southern continents as far as their southern tips (South Africa, South America). The almost complete absence of this great wanderer from Polynesia comes, therefore, as a surprise. In more than ten years of collecting, only six individuals were obtained by the Whitney expedition. The species is common on the Galápagos Islands, regular but not common on Hawaii, has been doubtfully reported from the Line Islands (Christmas, Palmyra), but is unrecorded from Polynesia except for the six birds listed below. These may have overshot their regular winter quarters in the Hawaiian Islands.

The sanderling is rare in the entire Western Pacific. There is only a single record from New Zealand, the species is a rarity in Australia and is entirely unrecorded from the Papuan region and from Celebes. It is uncommon even in the Malayan

Archipelago. There is a single record from the Marshall Islands (Jaluit, Finsch) and the four listed birds from Guam.

The reason for this scarcity in the Western Pacific is not apparent. It is possibly correlated with the absence of a continuous continental shore line to guide the birds across an ecologically rather unsuitable equatorial belt. Also, this is a rather hardy species, the bulk of the population probably never crossing the equator.

MICRONESIA

MARIANA ISLANDS: Guam, 1 ♂, 3 ♀, Dec. 2, 3, 4 (Owston).

CENTRAL POLYNESIA

UNION GROUP: Fakaafu, 1 ♂, 1 ♀, Apr. 2.

PHOENIX GROUP: Canton, 1 ♂, Mar. 12; Sydney, 1 ♀, Mar. 21.

EASTERN POLYNESIA

TUAMOTU ARCHIPELAGO: Ducie, 1 ♀, Mar. 20.

MARQUESAS ISLANDS: Nukuhiva, 1 ♀, Oct. 8.

SUMMARY

Winter range and migration season in Polynesia of seven species of shore birds have been determined. They are characteristic for each of the species.

Of the three circumpolar species, only the golden plover is common throughout the Pacific. The turnstone and the sandpiper have restricted winter ranges.

The American wandering tattler, although nesting in the Americas (Alaska), winters primarily in Polynesia. Breeding range and winter range of the bristle-thighed curlew are geographically restricted.

Non-breeding individuals of nearly all the species are found in their winter ranges during the northern summer months.

